

## PHYSIOTHERAPY IN THE TREATMENT OF CERVICAL DYSTONIA: INTEGRATIVE REVIEW

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**Abstract:** Cervical dystonia (CD) is a movement disorder characterized by involuntary and painful contractions of the cervical muscles, mainly interfering with the performance of ADLs due to movement limitation. Physiotherapy through myofascial release (LM) and other resources when associated with botulinum toxin (Tb-A) therapy can be effective in the management of CD. **Goal:** The aim of this study was to report the most effective method for the treatment of CD. **Method:** The study was developed in a bibliographical and integrative way, being conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement. The search for articles was in the Pubmed, Lilacs and PEDro databases, using the following descriptors: Cervical Dystonia, Botulinum Toxin, Physiotherapy. Articles in English and Portuguese, published from 2011 to 2022, were analyzed. **Results:** Studies with positive results were found for the treatment of CD through physiotherapy techniques associated with Tb-A. 70 articles were evaluated for the bibliographic and integrative review. In the first stage, 27 articles that maintained the criteria for the research were selected. In the second stage, 20 articles that did not coincide to remain in the research were excluded. In the last stage, 7 articles were chosen that presented methodological criteria that coincided with those proposed by the project and were analyzed. Such research has proven the efficiency of the techniques: LM, kinesiotherapy, functional electrostimulation in the muscles antagonistic to the dystonic pattern, and when associated with Tb-A, positive medium-term results are obtained in the first application. **Conclusion:** With this, we show that physiotherapy associated with the application of Tb-A has greater benefits for the patient. The combination of treatment does not detract from physiotherapy techniques, which provide pain relief, improves posture,

strengthens the affected muscles, works to prevent shortening and improves the patient's quality of life, but rather enhances the patient's improvement.

**Key words:** Cervical dystonia. Physiotherapy. botulinum toxin.

## INTRODUCTION

According to the Mayo Clinic Family Health Book, dystonia is characterized: "*A movement disorder caused by involuntary contraction of a muscle that produces movements such as tremors or abnormal postures*".

Cervical dystonia (CD) is a focal dystonia, as it affects a particular muscle or region of the body (Camfield, et al., 2002). It is a neurological disorder that generates an involuntary contraction of the cervical muscles, resulting in abnormal head posture accompanied by tremor, rigidity and pain (Tarsy and Simon, 2006). CD is idiopathic, appearing spontaneously (Lowestein and Aminoff, 1988). There are several patterns found in CD, namely: rotation (torticollis), lateral flexion (laterocollis), flexion (anterocollis) and extension (retrocollis). In addition, the shoulder forward pattern was also observed (Ramdharry, 2006). CD symptoms are potentially disabling, causing a negative impact on quality of life, on their basic activities of daily living, professional activities, on the individual's ability to interact in a social environment, thus affecting their mental health (Ramdharry, 2006). The main objectives in the treatment of CD are the reduction of pain, contractures, prevention of the rigid pattern and to restore the maximum possible functionality of the cervical region, thus allowing the individual to return to their normal daily and social activities (Goldman and Comella, 2000). At first, individuals with dystonia will be introduced to pharmacological treatment, the administration of intramuscular botulinum toxin (Tb-A), indicated mainly

for focal dystonias. Botulinum toxin will act on the affected muscles and control the characteristic spasms of the disease, causing relief and improvement in muscle tension, thus being the gold standard in treatment (Jankovic and Brin, 1991). But although pharmacological treatment is the first choice, associating physiotherapy with botulinum toxin is a way to optimize, to make the treatment of dystonia more effective (Jankovic, 2006; Ramdharry, 2006; Smania et al., 2003; Tassorelli et al., 2006). Physiotherapy prevents and treats functional kinetic disorders, being of paramount importance in the treatment of dystonia. The most used resources are: myofascial release, kinesiotherapy, stretching exercises, ways to improve range of motion, isometric exercises, (Tassorelli et al., 2006), electrostimulation, electroneuromyography (Tassorelli et al., 2006; Smania et al., 2004). Therefore, the present work aims to discuss the best treatment for CD, associating Tb-a with physiotherapy and its techniques.

## **MATERIALS AND METHODS**

The present study is an integrative review carried out through an online search of scientific productions, with the objective of evaluating the most effective method for the treatment of CD, associating physical therapy with Tb-a. The research was carried out between May and June 2022, through a bibliographic and integrative research following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement. The search for articles was in the Pubmed, Lilacs and PEDro databases, using the following descriptors: Cervical Dystonia, Botulinum Toxin, Physiotherapy. Articles in English and Portuguese, published from 2011 to 2022, were analyzed.

Inclusion criteria were articles that talked about the treatment of cervical dystonia by associating physiotherapy techniques

with botulinum toxin, articles that proved the effectiveness of myofascial release with botulinum toxin, articles that evaluated the improvement in quality of life after the association of physiotherapy with Tb-a, articles that evaluated the treatment period, whether there was a decrease in treatment time. Exclusion criteria were all articles that did not fit the proposed theme.

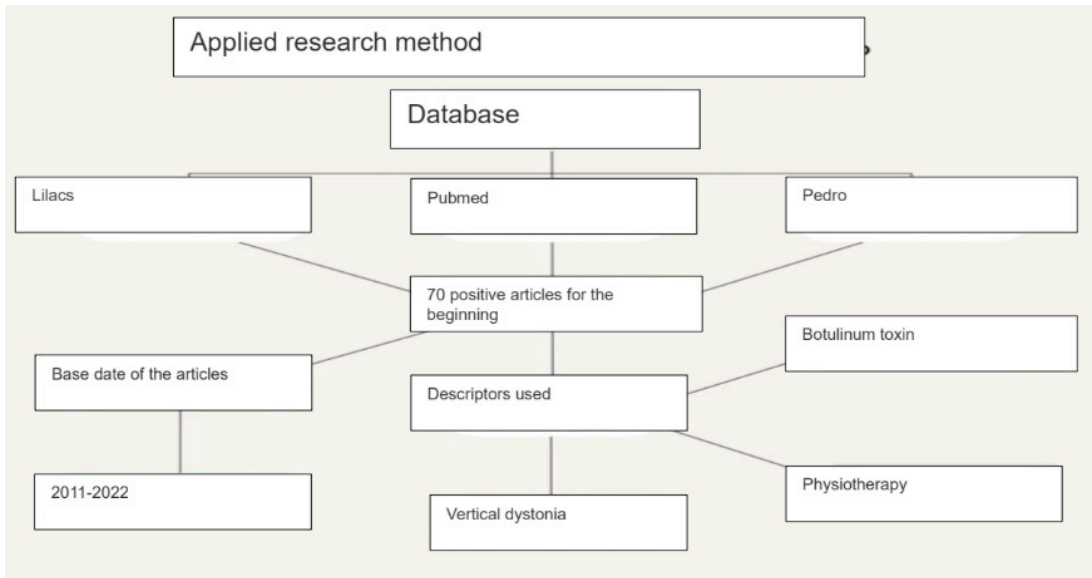
In total, 70 articles were found for the bibliographic and integrative review. In the first stage, 27 articles that maintained the criteria for the research were selected. In the second stage, 20 articles that did not coincide to remain in the research were excluded. In the last stage, 7 articles were chosen that presented methodological criteria that coincided with those proposed by the project and were analyzed.

## **RESULTS AND DISCUSSIONS**

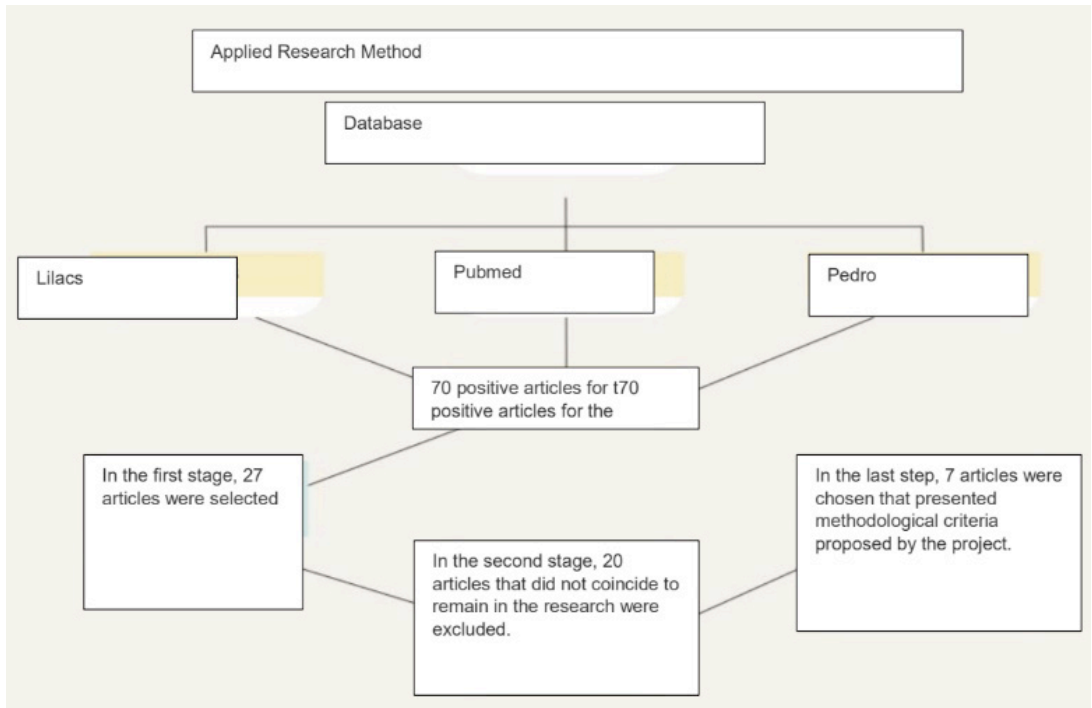
Physiotherapy is an adjuvant with potential in the treatment of CD, acting to improve pain, function and quality of life with traditional resources such as: stretching, relaxation, functional electrostimulation in the muscles antagonistic to the dystonic pattern, myofascial release and kinesiotherapy, has provided positive effects vascular, musculoskeletal and metabolic.

According to the Brazilian Society of Dermatology - SBD, botulinum toxin is a protein produced by the bacterium *Clostridium botulinum*, causing generalized paralysis, called botulism. When applied directly to the affected muscle, it acts on the neuromuscular junction in which it prevents the action of the neurotransmitter acetylcholine, which is responsible for stimulating muscle contraction.

Małgorzata (2020) in his research “improving the effectiveness of botulinum toxin therapy” reported that local intramuscular application of botulinum toxin



Source: Authors (2023)



type A (BoNT-A) is the treatment of choice, being effective and well tolerated. Therefore, the toxin acts by ensuring relaxation of the muscles at the site where it is applied. When BxT is injected into dystonic muscles, it produces a peripheral paresis that is localized, well controllable, and follows a distinct and predictable time course of about 3 months. Adverse effects are always transient and generally mild, long-term application is safe. (Dirk Dressler 2021).

Stretching and relaxation during the sessions are essential to reduce the tension generated with movement, whether static when performed in the same position, or dynamic when performed with broad movements, acting to improve mobility, posture, muscle flexibility, relieving stress, as well. it can be done passively, which is when another person performs the movement controlling the intensity and increasing flexibility.

Functional electrical stimulation (FES) is a technique that promotes muscle contractions through electrical stimulation, which depolarizes the motor nerve, causing strengthening of antagonistic muscles to the dystonic pattern (paretic). The electrical stimulus will generate an action potential in the myelinated fibers. The action potential produced by FES is similar to the biologically produced action potential (Sheffler and Chae, 2007). It is necessary to configure some standards, namely: pulse width in  $\mu\text{s}$  (microseconds), frequency in Hz (hertz), rise time in seconds, contraction time in seconds, fall time in seconds, rest time in seconds and intensity. The minimum frequency to stimulate a muscle is 12.5 Hz. In order not to generate muscle fatigue, minimum frequencies are used, around 50Hz and increase the pulse width (200  $\mu\text{s}$ ).

Myofascial release (LM) is a manual therapy that helps reduce muscle pain by working

on the pain focus, with friction, sliding, percussion and compression techniques. According to a study of 20 cases (Queiroz, M.R., 2012), a protocol of 25 minutes per session was applied, also associated with kinesiotherapy.

Kinesiotherapy is movement therapy that acts on the neuromusculoskeletal systems and on the restoration of the motor and circulatory systems, which helps relieve muscle tension, promotes muscle balance, range of motion and postural re-education. In the study of 20 cases (Queiroz, M.R., 2012) kinesiotherapy consisted of stretching the cervical muscles, passive and active-assisted mobilization, and pompages, in which an improvement in pain and quality of life was reported, in which it obtained positive but time-consuming results. , but when associated with TxB and other techniques the result was more effective.

The most used scale was the Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS), which is a scale used in studies of cervical dystonia in several countries (Tarsy, 1997; Cano et al., 2004; Ondo et al., 2005; Skogseid et al. Kerty; Zetterberg et al., 2005; Comella et al., 2011; Jost et al., 2013). This scale has 3 evaluation subscales, namely: motor, quality of life and pain. In all treatment groups, there was a significant improvement in dystonia symptoms measured with TWSTRS (total score) after Tb-a injection. In a study involving 15 cases, the TWSTRS disability domain improved slightly 6 weeks after the first BoNT injection (Castagna et al., 2020)

In an open study involving 40 CD patients, they were divided into two groups, one group treated with botulinum toxin and physiotherapy, and the other treated with botulinum toxin only. Improvement was observed in both groups, but the group in which Tb-a was associated with physiotherapy had a significant improvement in pain and disability scores, further improving the quality

Authors	Method	Result	Year
Comella CL, Jankovic J, Truong DD, Hanschmann A, Grafe S; U.S.	Prospective, double-blind, randomized, placebo-controlled, multicenter clinical trial	Safe and effective treatment for CD in previously treated subjects as well as toxin-naïve subjects.	2011
Queiroz, M.R.	Study of 20 cases	The present study evaluated the possibility that the use of BTX, together with a conventional physiotherapy protocol, without the use of biofeedback and easily reproducible, could aggregate improvements in symptoms such as severity, disability, pain and QoL of a population of individuals with CD.	2012
Hu W, Rundle-Gonzalez V, Kulkarni SJ, Martinez-Ramirez D, Almeida L, Okun MS, Wagle Shukla A.	Randomized Study	Physiotherapy is a potential adjunct in patients with cervical dystonia who report suboptimal benefits with BoNT therapy. Physiotherapy-related benefits in cervical dystonia are likely mediated through modulation of sensory plasticity.	2019
Van de Dool J, Visser B, Koelman JH, Engelbert RH, Tijssen MA.	Single-blind Randomized Controlled Study	Both groups showed similar improvements from baseline. Positive results in the SPT group were greater patient-perceived effects and overall health perception. Treatment costs were lower in the SPT group. With lower costs and similar effects to the SP program, it appears to be your preferred program for treating CD.	2019
Program: Castagna A, Caronni A, Crippa A, Sciumè L, Giacobbi G, Corrini C, Montesano A, Ramella M.	Study of 15 cases	Six weeks after the first BoNT injection (ie, at peak BoNT effect), the total TWSTRS score was better than baseline and remained improved at 12 weeks. The TWSTRS disability domain slightly improved 6 weeks after the first BoNT injection, but after a further 6 weeks it returned to its baseline level. Disability improved most towards the end of SPRInt (for example: 6 weeks after the second BoNT injection), being even less than after toxin alone. With a single-subject analysis, 4/10 patients who did not improve disability after BoNT improved after SPRInt plus BoNT.	2020
Dec-Ćwiek M, Porębska K, Sawczyńska K, Kubala M, Witkowska M, Zmijewska K, Antczak J, Pera J.	Clinical Trial	In all treatment groups, there was a significant improvement in dystonia symptoms measured with TWSTRS (total score) after BoNT injection, regardless of allocation to experimental treatment ( $p < .05$ ). ANOVA analysis did not reveal differences in any of the TWSTRS variables after the intervention. Quality of life was significantly improved after application of taping ( $p < .05$ , $p = .03$ ).	2022

Source: Authors (2023)

of life of these patients (Queiroz et al., 2012).

## CONCLUSION

Finally, from the readings and analyzes based on the studies presented, we evidenced that physiotherapeutic techniques associated with the application of Tb-A showed results with greater benefits for the patient. The combination of treatment does not detract

from the physiotherapy techniques, which have also shown positive results in pain relief, improved posture, strengthening of the affected muscles, working to prevent shortening and improving the patient's quality of life. Thus, in order to promote greater effects, we cannot deny that physiotherapy techniques bring good benefits, but the fact is, physiotherapy is beneficial in the treatment of cervical dystonia.

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